Patient Safety in Emergency Medical Services

Roundtable Report and Recommendations

October 2002

National Highway Traffic Safety Administration (NHTSA)

400 Seventh Street, S.W.
Washington, DC 20590
202-366-5440

Executive Summary

Background & Purpose

The 1999 Institute of Medicine (IOM) report on human error in medicine, "To Err is Human," brought patient safety issues to the attention of the Federal Government, the public, the press, and medical professionals. It has resulted in many Federal initiatives, including action by the Quality Interagency Coordination (QuIC) Task Force, a group comprised of Federal agency healthcare providers, users, and policy makers. In response to the IOM report, the President directed the QuIC to draft a Federal plan recommending actions to reduce errors in medicine. The QuIC issued its report to the President, "Doing What Counts For Patient Safety: Federal Actions to Reduce Medical Errors and Their Impact," in February 2000. The QuIC made numerous recommendations in its report to the President, which included:

- Establishing centers of excellence for various medical specialties
- Conducting root cause analyses of errors
- Developing voluntary error reporting systems
- Implementing patient safety and error reduction education programs for healthcare providers

The National Highway Traffic Safety Administration (NHTSA) is a member of the QuIC and supports patient safety initiatives in emergency medical services (EMS). On October 31 and November 1, 2001, the EMS Division of NHTSA sponsored a roundtable to discuss EMS patient safety and error reduction strategies. NHTSA invited Federal partners and representatives from EMS stakeholder organizations throughout the U.S. to attend the one-and-one-half-day roundtable of presentations and group discussion sessions. Participants in the roundtable discussed the types of error reduction activities occurring within other sectors of medicine in response to the IOM report and considered how the IOM report applies to EMS, and what patient safety activities EMS should be pursuing. This roundtable was the first Federally-organized event to discuss the topic of patient safety and error reduction specific to EMS.

The goals of the roundtable were to:

- Exchange and develop ideas concerning potential patient safety applications in EMS, allowing those involved in the profession to interact with each other and Federal agencies.
- Learn about patient safety activities in other areas of medicine and the Federal Government.
- Look at new technologies that might facilitate improved provider performance and error reduction in EMS.
- Determine future directions in which the EMS community might proceed to implement patient safety programs.

Roundtable Participants

Emergency medical services health care professionals from military, Federal agencies, EMS professional associations, and human performances specialists were among the invitees. An alphabetized list of presenters and participants is provided in Appendix A. A bibliography lists the web sites of stakeholder agencies and organizations represented at the roundtable, and resources for additional information on patient safety.

Activities

The activities of the one-and-one-half-day roundtable included the following presentations:

- **To Err is Human, To Learn Divine**
  Presented by LCDR Russ Davidson, Performance Technology Division, United States Coast Guard Headquarters
- **Current AHRQ Efforts Directed at Improving Patient Safety**
  Presented by Dr. Gregg Meyer, Center of Quality Improvement and Patient Safety, Agency for Healthcare Research and Quality (AHRQ)
- **"To Err is Human," Federal Strategies for Error Reduction**
  Presented by Dr. Art French, NHTSA, EMS Division

- **Wearable Computers**
  Presented by Mary Sand, Technical Training Specialist, Federal Aviation Administration

- **Handheld Devices Assisting Emergency Medical Field Personnel**
  Presented by George Aupperlee, Pennsylvania Department of Health EMS Office

- **EMS Charting with PDAs: Handheld Devices and Error Reduction**
  Presented by Greg George, Engineer Paramedic, San Diego Life and Safety

- **Use of Simulation in Error Reduction**

    - Dr. Joseph Ornato, Medical College of Virginia, Virginia Commonwealth University, Richmond, Virginia

    - Kevin Parrish, Center for Emergency Medicine, Pittsburgh, Pennsylvania

    - COL Chris Kaufmann, Department of Defense National Capital Area Simulation Center

- **DOD/VA Medical Team Training Initiatives**
  Presented by CAPT Frances Stewart, United States Navy

- **Error Reporting Systems and Error Taxonomy/Classification**
  Presented by Dr. James Battles, Center for Quality Improvement and Patient Safety, AHRQ

- **Medical Device Reporting**
  Presented by Sharon Kapsch, Center for Devices and Radiological Health, Food and Drug Administration

- **Medical Error Prevention and Reporting System (MEPARS)**
  Presented by Dr. Bob Gwinn, Medflight of Ohio

- **Engineering an Error Free Environment, A Systems Approach**
  presented by Dr. Matt Rice, National Patient Safety Foundation (NPSF)

Roundtable Focus Groups

This report contains a summary of the three focus group discussions and conclusions from the full-group discussions following the focus group presentations.

On the second day of the roundtable, participants divided into three groups to concentrate on the following key subjects: policy and administration, research, and technology.

Each group was asked to identify issues in EMS within their respective topics that might affect patient safety, and identify the problems and possible preventative actions relevant to those issues. Each group then presented their findings to the entire group for discussion and concurrence. The following section summarizes the full group's conclusions.

Focus Group: Policy and Administration

Roundtable participants recognized that patient safety is a complex issue within a complex subsystem (EMS) of the existing healthcare system. To facilitate the identification of patient safety issues, the group examined the following components of the pre-hospital care subsystem: patients, providers, leadership and management, equipment, and community.

Patients

Participants stressed that the patient is the primary concern and the focus of all patient care. The group also identified patient participation and access to EMS as the primary patient issues. Patients must take part in their own care and safety, and providers should encourage them to do so. Their participation enhances their own safety.

Patients also must know how to access the emergency care system. For example, calls made to 9-1-1 from wireless or cell phones cannot be automatically located at the present time; patients

or those around them must be able to identify their precise location so emergency personnel can be properly dispatched to their location.

Providers

Providers include everyone from the first responders to the physicians in the hospital. Provider issues that affect patient safety include human factors (i.e., performance, work cycles, communication, and psychological and physiological impairments), teamwork, training, and certification.

Providers need insight into the human factors affecting patient safety. Systems policy setters of the EMS system should recognize and tailor human factors to specific circumstances that affect the performance of direct care providers on the "front lines." For example, scheduling providers to work 24-hour shifts in busy urban and suburban areas where they receive several calls per day is likely to be too taxing on those providers. They easily become fatigued and risk making mistakes as a result. On the other hand, scheduling providers to work 24-hour shifts in rural areas where they receive only a few calls per day might be more appropriate.

Leadership and management

Patient safety requires commitment at all levels, particularly from top-level management. Management must have an awareness of, establish priorities for, and make a commitment to patient safety. Without buy-in from senior leadership, patient safety initiatives stall. Leadership and management should commit to measuring and improving patient safety factors as part of an overall quality improvement program.

Equipment

Equipment includes the medical, communication, and transportation equipment that providers use to perform their jobs. Equipment issues that affect patient safety include having correct equipment for the job in the appropriate quantity, maintaining the equipment properly, and

adequately training users on proper use of the equipment and on reporting of equipment problems that might affect patient safety.

Community

Ensuring patient safety requires the participation of everyone involved in patient care, including the community. A wide range of community members should be involved in patient safety initiatives, such as local political leaders, third-party providers, businesses, and the health care system administrators. These groups should examine inter-organizational communications, the availability of health care facilities, and public access to medical care. The entire community, working in concert, can improve EMS patient safety.

Focus Group: Research

Roundtable participants concluded that the most critical factor affecting EMS research is the limited size of the research base. This lack of research is due to a number of factors, including a lack of financing, the small number of qualified researchers, the absence of standardized error taxonomies, the lack of evidence-based best practices, and inadequate data systems. Those factors must be addressed before widespread research initiatives can get started and an adequate research base can be established.

The group suggested the following priorities to stimulate research initiatives.

- Identify leadership for patient safety.
- Conduct a meeting among interested parties and develop a white paper on EMS patient safety to help educate the EMS community. Affected Federal agencies, including NHTSA and AHRQ, should take the lead, with other groups such as the National Patient Safety Foundation (NPSF) taking part. This white paper would be circulated within the EMS community to raise awareness of the need and benefit of patient safety activities.
- Request that the IOM follow up on the 1999 report on human error in medicine with a report on the status of emergency care preparedness. This report would be circulated both within and outside of the EMS community to focus attention by policymakers on the need for EMS patient safety initiatives.

- Encourage EMS physicians to participate in EMS error research; they are important change agents and have a great deal of influence on EMS practice.
- Identify and encourage potential funders of patient safety initiatives.
- The group recognized that the Health Insurance Portability and Accountability Act (HIPAA) of 1996 poses uncertain legal and financial barriers for collecting research data.

Focus Group: Technology

Participants identified several technology issues that could affect EMS patient safety and recommended possible strategies for making progress in this area.

- To address the absence of information on errors, especially on the national level, the group recommended a national data system to improve access to information. This might consist of a web-based repository to which providers can easily submit data.
- Technology could also be utilized to address the lack of human factors knowledge in EMS. Possible actions include:
    - Applying performance technology principles and developing either paper-based or electronic job aids.
    - Conducting research on the human factors in patient care environments, drawing from aviation and firefighting initiatives in the area of crew resource management, which would also improve provider safety.
- Data technology could also be applied to address the lack of standardized data and a universally accepted EMS data set to establish patient safety "benchmarks." Benefits of standardized data collection include sharing of "lessons learned" and injury prevention data to enable providers to be proactive in trauma prevention. Possible actions to promote this technology include:
    - Implementing and providing incentive for universal use of a national standard EMS database.
    - Encouraging state and local agencies to work towards the goal of standardized data collection.
    - Giving adequate attention to the human factors that are barriers to electronic data collection and not letting technology force the user to adapt to it.

  - Encouraging manufacturers of patient monitoring devices to work with manufacturers of hand-held computers to facilitate seamless wireless technology and data transfer systems that are not so for use by pre-hospital professionals.

  - Using technology to improve EMS provider medical situational awareness through integration of multiple data inputs and simplified information displays.

  - Developing backups and "hardening" systems against intentional and unintentional threats.

- Currently, there is limited access to simulation training technology. One way to promote widespread use of this technology would be to fund regional initiatives to take simulation training to the field. This training should address human factors issues and team coordination training. Mobile simulations would get the training to those in the field who would benefit the most from it. This mobility is especially advantageous in rural areas. The participants recognized that cost is a real issue—cost sharing and grants might help address that issue.

- There are currently a number of problems with electronic communications and telemedicine. Possible actions to resolve these issues include establishing communications interoperability standards to improve the ability of systems to interact with and cross jurisdictional boundaries. Also, voice quality is important—reliable voice communications are vital to patient care and safety. All equipment should be user friendly; otherwise providers might be focused on the technology to the detriment of patient care.

Conclusions and Recommendations

After considering the information presented during the roundtable, activities in other medical specialties, the IOM and QuIC reports, and the current status of patient safety in EMS, the participants agreed upon the following conclusions and recommendations:

- Throughout the roundtable, the terms "patient safety" and "error reduction" were used almost interchangeably. Discussion concerning the two terms led to the conclusion that the term "patient safety" has a more positive, proactive connotation and is more likely to promote patient safety initiatives. Patient safety should be defined for both the EMS community and the general public. The term "error reduction" implies mistakes and providers might be reluctant to "advertise" their mistakes.

- The EMS community must position itself to define the direction of patient safety initiatives in the EMS field. Otherwise, others whose stakes are politically motivated (i.e., legislatures and government regulatory agencies) might make decisions for them.

- Much discussion centered on reporting systems. The consensus of the group was that reporting systems are of great value for improving patient safety. However, the details of what a reporting system would look like and how it would work are difficult to define. This is a complicated issue, but one that must be addressed. Great concern exists as to where EMS data would be stored and how it would be utilized. Furthermore, there were concerns about the security of EMS data and protection of patient privacy.

- The EMS community should take the lead in developing patient safety reporting systems to avoid the risk of being required to comply with a system designed by others.

- Research is needed to determine the most effective techniques for performance improvement, e.g., simulations, performance support systems, distributed learning networks, etc.

- Funding is a great concern—funding to conduct research, develop new and enhance existing systems, train providers, and educate stakeholders as well as the public.

- Participants agreed that forming partnerships and networking with others in the EMS community are important for patient safety to move forward. NHTSA, AHRQ, the National Patient Safety Foundation, EMS professional associations, and universities are all potential partners. AHRQ offers grants to eligible applicants to fund research and conferences. AHRQ representatives can also provide guidance on writing a grant application.

Resources

Further information related to patient safety in EMS is available on these web sites:

- Agency for Healthcare Research and Quality, www.ahrq.org
- Association of Air Medical Services, www.aams.org
- National Academy of Sciences, Institute of Medicine, www.iom.edu
- National Academy for State Health Policy, www.nashp.org
- National Highway Traffic Safety Administration, Emergency Medical Services Division, www.nhtsa.dot.gov/people/injury/ems/index.html
- Food and Drug Administration Center for Devices and Radiological Health, http://www.fda.gov/cdrh/useerror.html
- National Patient Safety Foundation, www.npsf.org
- Quality Interagency Coordination (QuIC) Task Force, www.quic.gov
- Society for Academic Emergency Medicine, www.saem.org

The following people participated in the roundtable:

- George J. Aupperlee, Pennsylvania Department of Health
- James B. Battles, PhD, CAPT USNR (Ret), Center for Quality Improvement and Patient Safety (CQuIPs), Agency for Healthcare Research and Quality (AHRQ)
- Allan Braslow, Braslow & Associates
- Jim Broselow, MD, North Carolina EMSC
- Theresa Cromling, RN, CEN, Duke Medical Center, Emergency Department & Injury Prevention Center
- LCDR Russ Davidson, U. S. Coast Guard
- Diana Fendya, MSW (R), RN, EMSC National Resource Center
- Eileen Frazer, Commission on Accreditation of Medical Transport Systems (CAMTS)
- CAPT Arthur J. French, MD, FACEP, NHTSA, EMS Division (NTS-14)
- Karen Frush, MD, Duke Medical Center, Emergency Department & Injury Prevention Center
- Greg George, EMT-P, San Diego Fire and Life Safety
- Bob Gwinn, DO, Medflight of Ohio
- Kerm Henriksen, PhD, Agency for Healthcare Research and Quality (AHRQ)
- Sharon Kapsch, Food and Drug Administration (FDA), Center for Devices & Radiological Health
- COL Chris Kaufmann, MD, National Capital Area Medical Simulation Center
- Marge Keyes, Center for Quality Improvement and Patient Safety (CQuIPs), Agency for Healthcare Research and Quality (AHRQ)
- Doug Kleiner, PhD, Society for Academic Emergency Medicine (SAEM)
- Kenneth R. Knipper, MD, NURC
- Dawn Mancuso, CAE, Association of Air Medical Services

- Gregg Meyer, MD, Center for Patient Safety and Quality Improvement
- Jeff Michael, Ed.D, NHTSA, EMS Division (NTS-14)
- John New, Quality Management, MIEMSS
- Joseph Ornato, MD, Medical College of Virginia, Virginia Commonwealth University
- Paul Paris, MD, Center for Emergency Medicine
- Kevin Parrish, RN, Laerdal R & D
- Joe Penner, CEO, Meckleburg EMS Agency, CAAS
- Matthew Rice, MD, JD, National Patient Safety Foundation
- Jim Richmann, RN, BS, CEN, Emergency Nurses Association
- Kathy Robinson, RN, Emergency Nurses Association
- Billy Rutherford, American Integrated Training Systems
- Mary E. Sand, Federal Aviation Administration
- Matt Spengler, International Association of Fire Chiefs
- CAPT Francis Stewart, MD, Health Affairs, Office of Secretary of Defense
- Walt Alan Stoy, PhD, EMT-P, CCEMT-P, Center for Emergency Medicine
- David Thomson, MS, MD, FACEP, NAEMSP
- Larry Wiersch, AAA
- CDR Bill Wyeth, NHTSA